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ABSTRACT

A statistical view was compiled of the impact of the Elementary and Secondary Education Act (ESEA) Title I programs on student achievement in all 55 West Virginia county school districts in school year 1978-79. The RMC Model A-1 design was used by each district. Nationally normed achievement tests or criterion referenced tests which were equated to national norms were administered for pretesting and posttesting of the treatment group. The report contains descriptions of: (1) the historical development of ESEA Title I since enactment in 1965; (2) the state's effort to implement Model A-1; and (3) the primary questions to be answered by the study which includes the number of students participating in the program, the number evaluated, and their mean gain scores in normal curve equivalents (NCE). Participant achievement is presented as the change in mean NCE gain scores. Mean gain scores are reported by the following variables: subject, grade, time spent in the program, method of presentation, and test interval. (Author/RL)

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ESEA TITLE I PROGRAM IMPACT

Final Report
School Year 1978-79

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PREFACE

This report reviews the impact of West Virginia's Elementary and Secondary Education Act Title I program during school year 1978-79. The 55 local education agencies in the state have provided the basic data for the report. The Education Amendments of 1974 (P.L. 93-380) and 1978 (P.L. 95-561) of the Elementary and Secondary Education Act (ESEA) Title I mandate that the report be made to the U.S. Commissioner of Education utilizing one or more evaluation models provided by the Commissioner [1978, Section 183 (d)]. Model A, the norm-referenced model, was selected for use in West Virginia.

The Division of Evaluation and Information Systems in the Bureau of Learning Systems agreed to accept responsibility for preparing the fiscal impact report in accordance with federal law and the related regulations and policies. In turn, ESEA Title I staff in the Bureau of Services and Federal Assistance agreed to provide appropriate support to produce and supply the necessary data from each of the local education agencies.

The report includes a brief overview of the mandate to evaluate ESEA Title I programs. The impact of the programs is discussed in terms of (1) the number of students who participated in the program; (2) the number of students who were tested; and (3) the mean gain scores of students who participated.

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INTRODUCTION

The impact of the Elementary and Secondary Education Act (ESEA) funds expended in the operation of Title I programs to improve the basic skills of disadvantaged students has been a concern in West Virginia since the initial expenditures were made in 1966. This section introduces the reader to a brief background of ESEA Title I which leads up to the present. Additionally, the reader is provided with a listing of limitations and a view of the organization of the remainder of the report.

Background of ESEA Title I

The basis for ESEA Title I programs in West Virginia may be traced to the original public law, P.L. 89-10, which was the Elementary and Secondary Education Act of 1965. This legislation became law with the signature of President Johnson on April 11, 1965. Since the original act was signed, many amendments have been made by subsequent Congresses. In 1974, Congress made amendments through enactment of P.L. 93-380. These amendments directed the Commissioner of the United States Office of Education (USOE) to provide state education agencies with models for the evaluation of diverse Title I programs. The models were to include uniform procedures which would make it possible to aggregate data from different programs in different locations. The procedures would make it possible to provide in-state, state-to-state, and nationwide summations of Title I impact. Further, the Commissioner was directed to provide technical assistance to the state agencies while they implemented the

models (P.L. 95-561, Section 183.a-e).

Further amendments to ESEA Title I were made by Congress in 1978. These amendments did not change the original intent of P.L. 93-380. Rather, the amendment clarified and refined the law. Public law 95-561, enacted on November 1, 1978, states that local education agencies may receive funds only if the following evaluation conditions are met:

(1) . . . effective evaluation procedures are adopted for evaluating, in accordance with the evaluation schedule promulgated by the Commissioner under Section 183.g, the effectiveness of the programs assisted under this title in meeting the special educational needs of educationally deprived children;
(2) such evaluations will include, during each three-year period, the collection and analysis of data relating to the degree to which programs assisted under this title have achieved their goals, including the requirements of Section 130, and will also include objective measurements of educational achievement in basic skills over at least a twelve-month period in order to determine whether regular school year programs have sustained effects over the summer; and
(3) the evaluation will address the purposes of the programs, including the requirements of Section 130, and the results of the evaluations will be utilized in planning for and improving projects and activities carried out under this title in subsequent years (ESEA, Title I, Section 124.g).

The state educational agencies . . . shall make to the Commissioner:

(1) periodic reports (including the results of objective measurements required by Section 124.g and of research and replication studies) evaluating the effectiveness of payments under this title and of particular programs assisted under it in improving the educational attainment of educationally deprived children, and
(2) such other reports as may be reasonably necessary to enable the Commissioner to perform his duties . . . (Section 172).

Finally, P.L. 95-561 requires:

> The Commissioner shall make a report to the respective committees of Congress having legislative jurisdiction over programs authorized by this title and the respective Committees on Appropriations no later than

> February 1, 1980, 1982, and 1984 concerning the results of evaluations . . . (Section 183.g).

Section 130 of P.L. 95-561 protects the rights of educationally deprived children to receive special educational services when such children are enrolled in private schools.

To assist with the fulfillment of the congressional mandate, the Commissioner of the United States Office of Education contracted with RMC Research Corporation (RMC), Mountain View, California. RMC subsequently developed a prototype system for evaluating and reporting which was disseminated to key Title I personnel in each state in 1976.

The Title I evaluation and reporting system was developed after interviews with policy makers in USOE, Department of Health, Education and Welfare (HEW), and Congress which revealed an interest in knowing the impact of special programs on the students served. This was followed by an extensive review of past Title I evaluation reports. The one prominent concern of all of those who were interviewed was to develop a system leading to reliable and valid data. To satisfy the concern required two things of the evaluation system: (1) flexibility in the evaluation design and (2) a common metric with an equal-interval scale. Flexibility, or diversity of evaluation design, was necessary to provide a design which would be acceptable to all LEA's for Title I evaluation purposes. A common metric was necessary for purposes of aggregating data across students and locations; i.e., across schools, LEA's, and states.

The evaluation system developed by RMC for the USOE provided both flexibility of evaluation design and a common metric. The system consisted of three evaluation models. These models are described in Appendix A, and they are identified as Model A (Norm-Reference Design),

Model B (Control Group Design), and Model C (Special Regression Design). Each model was developed to provide a measure of program impact in normal curve equivalents (NCE's)[1]--the common metric--which in each case was defined as the difference between observed post-treatment performance and pre-treatment performance. The treatment was described as the intervention --the program--which was provided between the two measured performances.

The metric developed by RMC for use with the three models also may be used with tests from different publishers, and even with locally developed tests. The common metric--the NCE--is described as a normalized standard score which is linearly transformed to match the percentile distribution at values of 1, 50, and 99. This, in turn, provides for a statistical mean of 50 and a standard deviation (SD) of 21.06. Thus, with an equal-interval scale, the metric is ideal for the type of reporting required in Title I programs; i.e., the reporting of student change which must be aggregable for the purpose of computing group change.

Key Title I personnel and evaluators from throughout West Virginia were introduced to the evaluation models by technical assistance center personnel in March of 1977. This initial meeting was followed by meetings with personnel in each of the local education agencies (LEA's) within the state. Following the introduction to the evaluation and reporting system 45 of 55 LEA's in West Virginia implemented one of the three evaluation models (Model A) in school year 1977-78. The impact of the Title I programs, which were implemented in the 45 LEA's, is reported in a published document titled Impact of ESEA Title I Programs on Education in West Virginia.

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[1]See Appendix B for a conversion table which was used in changing percentiles to NCE's.

Limitations of the Report

The introduction of a new Title I evaluation and reporting system did not automatically eliminate the problems and constraints under which the system must function. The system requires a great deal of knowledge and applied sophistication to attain a high degree of reliability and validity in the final report. This knowledge and sophistication may be necessary in conducting any of the following activities: selecting students, selecting tests, administering tests, scoring tests, converting raw scores, aggregating data, analyzing data, interpreting the analysis, and writing a report. Therefore, the problem, and also the constraint, to efficient implementation of the system was one of improving the staff capabilities at the school, LEA, and state level to match the state-of-the-art represented by Model A. Staff from each level continue to receive assistance in implementing the system from the regional technical assistance center which is located in Durham, North Carolina. This center is operated under contract with USOE by the NTS Research Corporation.

The problem has led to conditions and situations which confound and compound the task of reporting the true program impact. Although the state staff, with the assistance of the technical assistance center personnel, are effectively reducing the conditions that may cause problems, impingement of the following may affect this state report.

1. A wide variety of procedures were used to select students for program participation.

2. Test selection procedures may not have given enough weight to program content and objectives in some instances.

3. Test administration takes place under a wide variety of conditions with a large number of different administrators.

4. In some instances, testing dates exceeded the limits placed around the publishers norming date by the Title I User's Guide.

5. In some cases, functional level tests are administered without full understanding of how the resultant raw score should be treated.

6. Because of the continual movement of students into and out of Title I programs, those remaining to take the pretest and posttest were too few to be included in the aggregation for impact purposes.

7. Test scoring and conversion of raw scores to percentiles and NCE's are conducted in a variety of ways and by a variety of professional and non-professional personnel.

8. For the state report, data is first aggregated at school level and then at the LEA level.

Organization of the Report

This section, the Introduction, is followed by two additional sections. Each section may be considered as a module which is a necessary subpart of the whole report.

Section II presents the outcomes from the statistical analysis of the aggregated data derived from students' evaluations. The outcomes (impacts) are related to three major questions dealing with student participation student evaluation, and student mean gains in NCE's. Necessary notes and explanations are provided to insure that the reader understands the meaning of specific terms and procedures.

The final section, Section III, is provided to clarify and simplify the Title I program outcomes with some trends noted in the data.

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[2] G. Kasten Tallmadge and Christine T. Wood. User's Guide. Washington D.C.: U.S. Government Printing Office, 1978, pp. 48-9.

Conclusions deal with procedures and implications for improving the data analysis, implications when Model A is used, implications for the LEA's, and strong trends which may lead the reader to develop new ideas about effective instructional settings.

II. OUTCOMES OF THE ESEA TITLE I PROGRAM

The statistical data which provides the basis for this report were derived from the 1978-79 Title I reports submitted by the local education agencies. All 55 county school districts used Model A, the norm-referenced evaluation model. In this section, the outcomes (findings) of the study will be provided in response to a set of questions which were conceived and stated by West Virginia Title I staff as a part of the overall planning and development of the data collection instrument.[1] Definition of terms and an explanation of the conditions are provided for an understanding of data presented in response to the questions. Since the instrument was designed to supply impact data useful to LEA's and the state, as well as that mandated by Congress, the form in which the data is reported herein is unique to West Virginia.

Questions

The data collection instrument which is included in the ESEA Title I Evaluation Handbook was developed to provide appropriate data to answer preconceived questions about Title I impact. Three broad questions were stated.

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[1] A copy of the ESEA Title I Evaluation Handbook may be obtained by contacting the Director, ESEA Title I, West Virginia Department of Education, Capitol Complex, Charleston, West Virginia 25305.

1. How many students participated in the Title I program?

2. How many participating students were evaluated (i.e., they were administered both a pretest and a posttest)?

3. For those students evaluated, what were the mean gain scores in NCE's?

In the ensuing Data Description Summary, these broad questions are considered with respect to single and multiple variables. That is, in the case of student participants, the variables were grade level and subject. For the number of tested students, the presentation and grade level variables were considered. And, mean gain scores were considered with grade level, subject, time, presentation, and testing dates as interacting variables.

Notes and Explanations

To assist the reader to understand the information presented in this section, an explanation of terms used and procedures followed in deriving and reporting the data is presented.

Cell. A cell refers to a single data position within a table. The position may or may not contain data.

NCE. An NCE represents a normal curve equivalent. The normal curve equivalent is a normalized curve which has been linearly transformed to match the percentile distribution at values of 1, 50, and 99. It has a mean of 50 and a standard deviation of 21.06 NCE's. NCE's are equal-interval scales, which makes it legitimate to use them in addition, subtraction, multiplication, and division.

NCE as an equal-interval scale. Because NCE's are an equal-interval scale, one NCE does not always have the same equivalence as a percentile. The percentile is a score point below which a given percent of the tested

students fall. At the lower and upper end of the NCE scale (from 1 to 10 NCE's and from 90 to 99 NCE's) less than 5 NCE's are approximately equivalent to 2 percentiles while there are approximately 5 NCE's for each 9 percentiles near the 50th NCE. (See Figure 1.) Therefore, as a group of below level (below the 50th NCE) students improve, equal percentile changes result in numerically larger NCE gains.

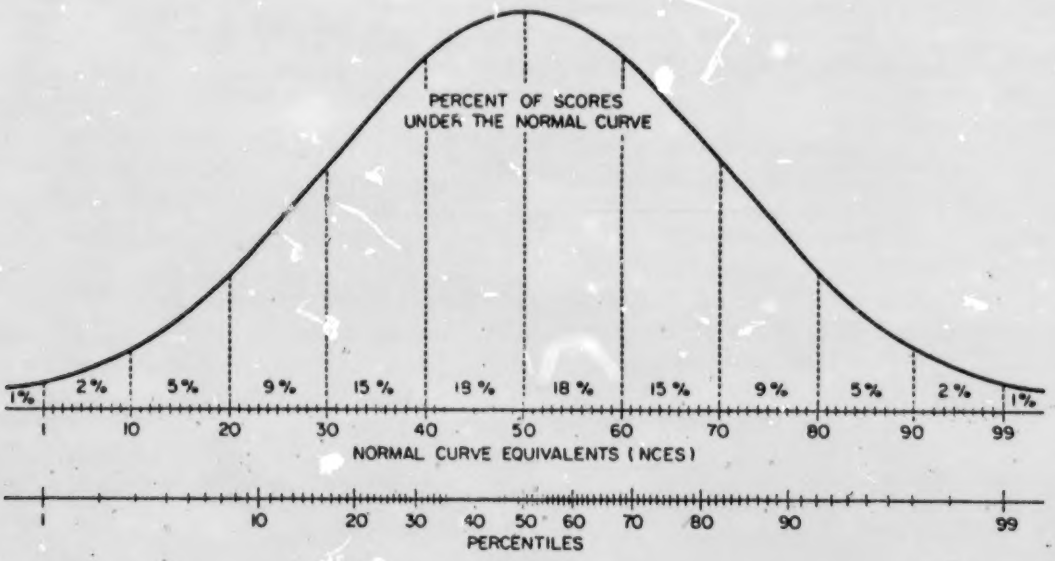

FIGURE 1

AREA UNDER THE NORMAL CURVE DIVIDED
INTO NCE's AND PERCENTILES

N-count. The number of students with both a pretest and posttest score who are included in the evaluation.

Presentation procedure. Presentation procedure (or simply presentation) refers to the intervention process used with the students for the

purpose of improving their performance in math and reading. The procedures were numbered and defined by the state Title I staff as follows:

1. Students removed from the regular class to receive services performed by an aide on a one-to-one basis.

2. Students removed from the regular class to participate in a group of two or more students being served by an aide.

3. Students removed from the regular class in groups of ten or more to participate in a Title I class or laboratory conducted by a teacher.

4. Students removed from the regular class in groups of fewer than ten to participate in a Title I class or laboratory conducted by a teacher.

5. Students removed from the regular class in groups of ten or more to participate in a Title I class or laboratory conducted by a teacher and an aide.

6. Students removed from the regular class in groups of fewer than ten to participate in a Title I class or laboratory conducted by a teacher and an aide.

7. Students receiving Title I services from a Title I aide in the regular classroom.

8. If none of the procedures above is descriptive of the intervention process.

Suspect data. To reduce the amount of data which may result from anomalies due to characteristics of an excessively small group (small n-count), tabled data based on less than an n-count of 10 was considered highly suspect. Further, any n-count of less than 50 remained suspect. Therefore, the narrative description in this section does not include such data. Although the author of this report does not have confidence in data derived from relatively small n-counts, the reader may peruse the data provided in the tables in this section as interest develops and need requires.

Data Description Summary

All 55 local education agencies in West Virginia used the Model A evaluation method as the basis for their report to the state. This description is derived from an aggregation and analysis of the data provided by the agencies.

Number of Title I participants. The total unduplicated count of participants in Title I programs in the 55 LEA's was 41,573. This number was divided among grades 1-12 and special education with the twelfth grade having 120 (smallest number) and the second grade 7,453 (largest number). The division of participants among the grade levels is shown in Table 1.

Table 2 presents a duplicated count of participants by subject and presentation. Reading participants totaled 33,547 while math participants totaled 10,355 across the eight presentation procedures. Presentation 5 was used most often with reading students (9,707), and presentation 2 was used most often with math students (2,515).

Total number of tested participants. Table 3 shows the total number of students tested as a function of subject, grade, and presentation. Presentation 1 was not widely used by those students who were tested in math (71 students tested); however, it was used more frequently by those students who were tested in reading (1,593 students tested). Presentation 3 was used by 88 of the participants who were tested in math. The total number of participants tested was 26,528 in reading and 8,094 in math.

TABLE 1

UNDUPLICATED COUNT OF PARTICIPANTS
IN TITLE I PROGRAMS

GRADE AND SPECIAL ED.[a]	NUMBER OF PARTICIPANTS	GRADE	NUMBER OF PARTICIPANTS	GRADE	NUMBER OF PARTICIPANTS
Special Ed.	933				
1	5,385	5	5,637	9	419
2	7,453	6	4,839	10	329
3	6,625	7	1,874	11	158
4	6,745	8	1,083	12	120
TOTAL ALL GRADES AND SPECIAL EDUCATION					41,573

[a]Special education students who were not assigned to a specific grade level.

TABLE 2

DUPLICATED COUNT OF PARTICIPANTS[a] IN TITLE I PROGRAMS
BY SUBJECT AND PRESENTATION

PRESENTATION	SUBJECT	
	MATH	READING
1	82	1,996
2	2,515	1,298
3	134	1,705
4	2,378	8,884
5	779	9,707
6	1,748	7,669
7	2,162	1,396
8	557	892
TOTAL	10,355	33,547

[a]Does not include the 933 special education participants (unduplicated count). However, it does include 494 of the 5,358 first grade participants (unduplicated count). All other Title I participants at all grade levels are included.

TABLE 3

NUMBER OF PARTICIPANTS TESTED IN TITLE I PROGRAM
BY SUBJECT, BY GRADE, AND BY PRESENTATION

GRADE	MATH PRESENTATION								GRADE	READING PRESENTATION							
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
1	0	37	0	0	0	18	8	0	1	46	49	13	0	59	96	22	0
2	0	288	0	185	128	144	353	32	2	677	239	254	1509	1234	1204	397	124
3	23	353	33	255	145	185	407	85	3	410	222	240	1307	1378	1126	306	98
4	10	480	0	519	148	448	363	134	4	208	158	188	1676	1235	1207	149	145
5	20	297	0	462	122	282	362	101	5	122	150	252	1241	1073	924	126	111
6	18	274	0	372	117	270	297	86	6	108	101	202	919	900	813	139	100
7	0	70	16	35	8	6	4	2	7	9	127	153	295	787	142	0	82
8-9	0	13	39	26	4	0	6	0	8-9	13	43	154	256	616	114	4	21
10-12	0	0	0	0	0	0	0	0	10-12	0	1	0	68	386	0	0	0
1-12	71	1812	88	1858	672	1353	1800	440	1-12	1593	1090	1456	7271	7668	5626	1143	681
	TOTAL ALL GRADES - Math Presentation 8094									TOTAL ALL GRADES - Reading Presentation 26528							

Mean gain scores of tested participants. Weighted mean Normal Curve Equivalent (NCE) gains were calculated as a function of the subject, grade, time in program, presentation, and testing dates. These gains were calculated as a function of various combinations of the noted variables. The resultant gains are shown in Table 4 through Table 11-8.

The LEA's provided aggregated, weighted means as a function of the above listed variables. This was attained by the LEA's by multiplying the NCE gain (or loss) by the number of tested students from each reporting school; then the gains across all schools were totaled and divided by the total number of students tested.

The weighted mean NCE gains provided to the state were entered on the state computer at Charleston, West Virginia. Through computer programs, the aggregates of the LEA reported gains were used to attain statewide gain.

Table 4 through Table 10 show the total number of students tested as 23,507 in reading and 7,016 in math. These figures are not the same as those reported in Table 3--26,528 in reading and 8,094 in math. This apparent discrepancy results from the application of a rule which states that more than 66 percent of a group of students must be tested in order that the group data may be included in calculations of program impact (Policy Manual, Subpart D--Evaluation, March 9, 1979). If fewer than two-thirds of the student project membership is evaluated, the data from those students tested may not be representative of the total group. The totals as reported in Table 4 reflect the decrease from the application of the 66 percent rule. These smaller numbers of tested students were used in all the statewide calculations of Title I impact.

TABLE 4

MEAN GAIN SCORES BY SUBJECT
AND BY GRADE

GRADE	Reading Program		GRADE	Math Program	
	N	Mean NCE Gain[a]		N	Mean NCE Gain[a]
1	240	16.5596	1	55	17.6891
2	4742	7.1768	2	924	4.5771
3	3940	4.6586	3	1264	6.3498
4	4756	4.4664	4	1920	8.6118
5	3618	3.0218	5	1404	5.6004
6	3092	3.4272	6	1270	5.3015
7	1545	5.9953	7	132	8.0061
8-9	1179	1.6326	8-9	47	3.7915
10-12	395	5.3858	10-12	0	--
1-12	23507	4.7836	1-12	7016	6.4985

[a]Mean gain scores are stated in NCE's (Normal Curve Equivalents).

On many of the tables related to Title I impact--Table 4 through Table 11-8--the number of students evaluated (those with a pretest and posttest) in grades 1, 8-9, and 10-12 is relatively small. The mean gains at these grade levels may be suspect. This occurs as a result of possible anomalies which may come about where excessively small groups are encountered. The tables show the gains at these grade levels for the reader's perusal; however, since many are suspect, they will not be considered in the ensuing discussion.

Reading program gains ranged from a high of 7.2 NCE's in grade 2 to a low of 3.0 NCE's in grade 5. The high (8.6 NCE's) and low (4.6 NCE's) gains in math were noted at grade 4 and grade 2, respectively (see Table 4).

Time spent in the Title I program is reported in hours per week. Table 5 indicates a trend toward better gains as time in the program increases. This trend, however, is tempered somewhat above 3.6 hours per week. Above 3.6 hours per week gains are often no better or even less than those attained for a smaller amount of program time--1.9 to 3.6 hours per week. This trend is true for both reading and math programs.

In Table 6, mean gains are best where the presentation involved the teacher or both the teacher and aide. Overall, aides were less effective in producing gains than the teacher-aide combination or teachers alone.

Gains in achievement seem to be easier to attain in reading (7.8 NCE's) when presentation 3 is utilized. Also, presentation 2 shows promise as an instructional method in reading (6.1 NCE's). The lowest gain in reading (0.9 NCE's) was attained with presentation 7. The math program was most successful (12.3 NCE's) when presentation procedure 6 was used, and least successful (2.8 NCE's) when presentation 8 was used (see Table 7).

TABLE 5

MEAN GAIN SCORES BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM			GRADE	MATH PROGRAM		
	Time: Hr./Wk.	N	Mean NCE Gain		Time: Hr./Wk.	N	Mean NCE Gain
1	0-1.8	51	17.24	1	0-1.8	3	0.20
	1.9-3.6	132	16.24		1.9-3.6	52	5.68
	3.7-5.4	57	16.70		3.7-5.4	- -	- -
2	0-1.8	934	5.19	2	0-1.8	115	1.41
	1.9-3.6	2964	7.37		1.9-3.6	776	4.82
	3.7-5.4	844	8.68		3.7-5.4	33	9.88
3	0-1.8	439	2.14	3	0-1.8	220	5.80
	1.9-3.6	2708	4.95		1.9-3.6	1008	6.99
	3.7-5.4	793	5.07		3.7-5.4	36	- 8.29
4	0-1.8	326	2.68	4	0-1.8	155	4.31
	1.9-3.6	3519	4.41		1.9-3.6	1624	7.54
	3.7-5.4	911	5.31		3.7-5.4	141	4.01
5	0-1.8	286	4.21	5	0-1.8	43	1.98
	1.9-3.6	2444	2.56		1.9-3.6	1268	7.69
	3.7-5.4	888	3.90		3.7-5.4	93	6.79
6	0-1.8	335	3.90	6	0-1.8	35	3.29
	1.9-3.6	1938	3.88		1.9-3.6	1125	5.90
	3.7-5.4	819	2.17		3.7-5.4	110	2.40
7	0-1.8	69	4.89	7	0-1.8	8	- 0.70
	1.9-3.6	348	6.86		1.9-3.6	81	11.34
	3.7-5.4	1128	5.80		3.7-5.4	43	3.34
8-9	0-1.8	111	4.26	8-9	0-1.8	7	- 4.60
	1.9-3.6	105	5.67		1.9-3.6	31	5.89
	3.7-5.4	963	0.89		3.7-5.4	9	3.10
10-12	0-1.8	17	14.10	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	378	4.99		3.7-5.4	- -	- -
1-12	ALL TIMES	23507	4.78	1-12	ALL TIMES	7016	6.50

TABLE 6

MEAN GAIN SCORES BY SUBJECT,
BY GRADE, AND BY PRESENTATION

GRADE	READING PROGRAM			GRADE	MATH PROGRAM		
	Presentation[a]	N	Mean NCE Gains		Presentation[a]	N	Mean NCE Gains
1	T-A	145	18.43	1	T-A	18	19.62
	T	- -	- -		T	- -	- -
	A	95	13.70		A	37	16.75
	Other	- -	- -		Other	- -	- -
2	T-A	1811	7.97	2	T-A	242	6.32
	T	1587	8.33		T	159	3.80
	A	1229	5.14		A	502	3.75
	Other	115	0.43		Other	21	10.06
3	T-A	1850	5.55	3	T-A	327	7.08
	T	1221	6.19		T	202	7.95
	A	779	0.62		A	654	6.58
	Other	90	0.46		Other	81	- 2.44
4	T-A	2361	4.57	4	T-A	589	13.52
	T	1813	4.96		T	477	6.65
	A	467	2.65		A	720	6.65
	Other	115	1.96		Other	134	4.54
5	T-A	1693	5.08	5	T-A	328	10.74
	T	1473	1.83		T	454	4.36
	A	357	2.59		A	521	3.17
	Other	95	6.15		Other	101	7.01
6	T-A	1531	2.20	6	T-A	330	6.15
	T	1117	5.76		T	358	7.63
	A	344	1.52		A	496	4.29
	Other	100	1.97		Other	86	- 1.86
7	T-A	922	6.08	7	T-A	14	4.47
	T	425	3.76		T	44	1.86
	A	132	8.88		A	74	12.33
	Other	66	3.12		Other	- -	- -
8-9	T-A	697	0.25	8-9	T-A	4	- 9.40
	T	406	3.68		T	24	6.41
	A	55	3.29		A	19	3.26
	Other	21	3.62		Other	- -	- -
10-12	T-A	377	4.97	10-12	T-A	- -	- -
	T	17	14.10		T	- -	- -
	A	1	14.20		A	- -	- -
	Other	- -	- -		Other	- -	- -
1-12	ALL PRESENTATIONS	23507	4.78	1-12	ALL PRESENTATIONS	7016	6.50

[a]In this table procedures with instructional personnel commonality are grouped and reported as one presentation. That is, T-A refers to teacher and aide, T refers to teacher only, A refers to aide only, and Other refers to any other presentation.

TABLE 7

MEAN GAIN SCORES BY SUBJECT
AND BY PRESENTATION

PRESENTATION	READING PROGRAM		PRESENTATION	MATH PROGRAM	
	N	Mean NCE Gain		N	Mean NCE Gain
1	1,419	3.74	1	71	14.42
2	949	6.13	2	1,238	5.35
3	1,443	7.75	3	49	5.78
4	6,616	4.69	4	1,669	6.02
5	6,932	4.60	5	669	4.75
6	4,455	5.56	6	1,183	12.31
7	1,091	0.94	7	1,714	5.08
8	602	2.37	8	423	2.76
TOTALS	23,507	4.78	TOTALS	7,016	6.50

The fall-to-spring testing cycle provided greatly superior mean gains for both reading and math programs compared to gains for the spring-to-spring cycle. In the reading program, the gains for the fall-to-spring cycle ranged from 14.9 NCE's to 7.1 NCE's, while the range was 4.0 NCE's to 1.3 NCE's for the spring-to-spring cycle. The math program gains for the fall-to-spring cycle ranged from 25.9 NCE's to 15.1 NCE's, and for the spring-to-spring cycle the range was from 6.7 NCE's to 4.0 NCE's (see Table 8).

The math program (see Table 9) shows some consistency in mean gains across all presentations. The mean gains are generally highest in the time category of 1.9 to 3.6 hours of instruction per week. No other trend is apparent which would indicate superior gains attributable to presentation and time spent on instruction.

Table 10 shows that the fall-to-spring testing cycle consistently produced superior mean gains compared to mean gains achieved by those students tested on a spring-to-spring cycle. This was true for both the reading and math program and for presentations where participants were tested.

Table 11 presents a detailed view of the mean gains by four functions: presentation, subject, grade level, and time category. Because the extensive data requires a large number of cells, the table is divided into eight subtables designated by the numbers 1 through 8 which follow the hyphen. The number following the hyphen corresponds to the number which identifies the presentation.

Many mean gains in Table 11 are suspect due to the small number of students evaluated (a small n-count). Therefore, as a result of a reduction in the number of cells that are clearly non-suspect, this

TABLE 8

MEAN GAIN SCORES BY SUBJECT, BY GRADE, AND BY TEST DATES

GRADE	READING PROGRAM			GRADE	MATH PROGRAM		
	Test Dates[a]	N	Mean NCE Gain		Test Dates[a]	N	Mean NCE Gain
1	S & S F & S	149 91	14.10 20.59	1	S & S F & S	21 34	9.46 22.77
2	S & S F & S	3,363 1,379	4.03 14.86	2	S & S F & S	902 22	4.08 24.75
3	S & S F & S F & F	2,681 1,203 56	1.80 10.72 11.48	3	S & S F & S F & F	1,166 98	5.62 15.05
4	S & S F & S	3,587 1,169	3.20 8.36	4	S & S F & S	1,732 188	6.74 25.89
5	S & S F & S	2,680 936	1.34 7.84	5	S & S F & S	1,251 153	3.99 18.80
6	S & S F & S	2,395 697	2.36 7.08	6	S & S F & S	1,140 130	4.09 15.96
7	S & S F & S	842 703	3.91 8.50	7	S & S F & S	103 29	5.00 18.70
8-9	S & S F & S	1,003 176	0.81 6.33	8-9	S & S F & S	47 - -	3.79 - -
10-12	S & S F & S	275 120	4.22 8.06	10-12	S & S F & S	- - - -	- - - -
1-12	ALL TEST DATES	23,507	4.78	1-12	ALL TEST DATES	7,016	6.50

[a]Test dates refer to the pretest and posttest dates. S & S means pretest was in the spring followed by posttest the next spring. F & S means pretest was in the fall followed by posttest the next spring. F & F means pretest was in the fall followed by posttest the next fall.

TABLE 9

MEAN GAIN SCORES BY SUBJECT, BY PRESENTATION, AND BY TIME

PRESENTATION	READING PROGRAM			PRESENTATION	MATH PROGRAM		
	Time: Hr./Wk.	N	Mean NCE Gain		Time: Hr./Wk.	N	Mean NCE Gain
1	0-1.8	1,355	3.22	1	0-1.8	- -	- -
	1.9-3.6	64	14.77		1.9-3.6	71	14.42
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
2	0-1.8	138	3.67	2	0-1.8	111	11.91
	1.9-3.6	782	6.46		1.9-3.6	1,105	4.78
	3.7-5.4	29	8.92		3.7-5.4	22	0.56
3	0-1.8	86	1.79	3	0-1.8	- -	- -
	1.9-3.6	1,043	9.71		1.9-3.6	33	6.60
	3.7-5.4	314	2.87		3.7-5.4	16	4.10
4	0-1.8	691	5.75	4	0-1.8	38	-0.48
	1.9-3.6	5,203	4.66		1.9-3.6	1,613	6.23
	3.7-5.4	722	3.96		3.7-5.4	18	1.22
5	0-1.8	- -	- -	5	0-1.8	262	3.09
	1.9-3.6	2,034	2.87		1.9-3.6	257	7.09
	3.7-5.4	4,898	7.52		3.7-5.4	150	2.19
6	0-1.8	186	9.24	6	0-1.8	53	7.93
	1.9-3.6	3,917	5.77		1.9-3.6	1,126	12.53
	3.7-5.4	352	1.30		3.7-5.4	4	9.30
7	0-1.8	77	3.70	7	0-1.8	24	7.10
	1.9-3.6	988	0.54		1.9-3.6	1,649	4.91
	3.7-5.4	26	8.16		3.7-5.4	41	10.93
8	0-1.8	35	2.97	8	0-1.8	98	3.71
	1.9-3.6	127	2.81		1.9-3.6	111	5.77
	3.7-5.4	440	2.19		3.7-5.4	214	0.77
1-8	ALL TIMES	23,507	4.78	1-8	ALL TIMES	7,016	6.50

TABLE 10

MEAN GAIN SCORES BY SUBJECT, BY PRESENTATION, AND TEST DATES

PRESENTATION	READING PROGRAM			PRESENTATION	MATH PROGRAM		
	Test Dates[a]	N	Mean NCE Gain		Test Dates[a]	N	Mean NCE Gain
1	S & S	1,219	2.79	1	S & S	23	3.50
	F & S	200	9.52		F & S	48	19.65
2	S & S	565	1.38	2	S & S	1,151	4.36
	F & S	384	13.11		F & S	87	18.39
3	S & S	579	3.05	3	S & S	16	4.10
	F & S	864	10.89		F & S	33	6.60
4	S & S	5,742	3.96	4	S & S	1,519	5.45
	F & S	863	9.40		F & S	150	11.82
	F & F	11	17.10				
5	S & S	4,520	1.81	5	S & S	669	4.75
	F & S	2,367	9.82		F & S	- -	- -
	F & F	45	10.10				
6	S & S	2,761	2.73	6	S & S	847	7.02
	F & S	1,694	10.18		F & S	336	25.65
7	S & S	1,066	0.84	7	S & S	1,714	5.08
	F & S	25	5.20		F & S	- -	- -
8	S & S	523	2.13	8	S & S	423	2.76
	F & S	79	3.90		F & S	- -	- -
1-8	ALL TEST DATES	23,507	4.78	1-8	ALL TEST DATES	7,016	6.50

[a]Test dates refer to the pretest and posttest dates. S & S means pretest was in the spring followed by posttest the next spring. F & S means pretest was in the fall followed by posttest the next spring. F & F means pretest was in the fall followed by posttest the next fall.

discussion of the table is limited to the totals across all time categories and all grade levels. That is, it is limited to the totals at the bottom of the subtables.

When all time categories and all grade levels are considered, presentation 3 was the most successful instructional method (7.8 NCE's) in reading. Presentation 7 enjoyed the least success (0.9 NCE's). In the math program, presentation 1 was most successful (14.4 NCE's), while presentation 8 was least successful (2.8 NCE's). Both presentation 1 and 8 in the math program had relatively small overall n-counts; therefore, one should more realistically consider presentation 6 most successful (12.3 NCE's) and presentation 5 least successful (4.8 NCE's).

TABLE 11-1

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #1			GRADE	MATH PROGRAM PRESENTATION #1		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8	45	13.90	1	0-1.8	- -	- -
	1.9-3.6	1	10.60		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
2	0-1.8	596	4.02	2	0-1.8	- -	- -
	1.9-3.6	42	23.70		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
3	0-1.8	319	0.88	3	0-1.8	- -	- -
	1.9-3.6	10	-11.10		1.9-3.6	23	3.50
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
4	0-1.8	174	2.33	4	0-1.8	- -	- -
	1.9-3.6	7	3.20		1.9-3.6	10	26.80
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
5	0-1.8	93	2.16	5	0-1.8	- -	- -
	1.9-3.6	4	6.90		1.9-3.6	20	18.90
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
6	0-1.8	105	3.75	6	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	18	16.50
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
7	0-1.8	5	3.50	7	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
8-9	0-1.8	12	2.30	8-9	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
10-12	0-1.8	- -	- -	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
1-12	ALL TIMES	1,419	3.74	1-12	ALL TIMES	71	14.42

TABLE 11-2

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #2			GRADE	MATH PROGRAM PRESENTATION #2		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8	- -	- -	1	0-1.8	- -	- -
	1.9-3.6	49	13.59		1.9-3.6	37	16.75
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
2	0-1.8	23	3.28	2	0-1.8	- -	- -
	1.9-3.6	177	8.93		1.9-3.6	181	4.60
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
3	0-1.8	8	-1.10	3	0-1.8	12	2.70
	1.9-3.6	160	5.02		1.9-3.6	240	4.90
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
4	0-1.8	11	-2.54	4	0-1.8	88	14.10
	1.9-3.6	126	4.88		1.9-3.6	269	4.30
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
5	0-1.8	42	5.20	5	0-1.8	- -	- -
	1.9-3.6	86	4.80		1.9-3.6	139	4.88
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
6	0-1.8	21	-1.21	6	0-1.8	11	4.40
	1.9-3.6	79	1.69		1.9-3.6	178	2.12
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
7	0-1.8	17	9.70	7	0-1.8	- -	- -
	1.9-3.6	93	8.80		1.9-3.6	54	15.81
	3.7-5.4	17	10.09		3.7-5.4	16	0.10
8-9	0-1.8	16	6.86	8-9	0-1.8	- -	- -
	1.9-3.6	12	1.70		1.9-3.6	7	1.30
	3.7-5.4	11	6.64		3.7-5.4	6	1.80
10-12	0-1.8	- -	- -	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	1	14.20		3.7-5.4	- -	- -
1-12	ALL TIMES	949	6.13	1-12	ALL TIMES	1,238	5.35

TABLE 11-3

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT, BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #3			GRADE	MATH PROGRAM PRESENTATION #3		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	1	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
2	0-1.8 1.9-3.6 3.7-5.4	- - 254 - -	- - 14.14 - -	2	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
3	0-1.8 1.9-3.6 3.7-5.4	- - 240 - -	- - 10.20 - -	3	0-1.8 1.9-3.6 3.7-5.4	- - 33 - -	- - 6.60 - -
4	0-1.8 1.9-3.6 3.7-5.4	- - 188 - -	- - 9.03 - -	4	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
5	0-1.8 1.9-3.6 3.7-5.4	45 168 39	2.70 7.75 4.50	5	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
6	0-1.8 1.9-3.6 3.7-5.4	41 161 - -	0.80 5.73 - -	6	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
7	0-1.8 1.9-3.6 3.7-5.4	- - 32 121	- - 5.10 2.32	7	0-1.8 1.9-3.6 3.7-5.4	- - - - 16	- - - - 4.10
8-9	0-1.8 1.9-3.6 3.7-5.4	- - - - 154	- - - - 2.88	8-9	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
1-12	ALL TIMES	1,443	7.75	1-12	ALL TIMES	49	5.78

TABLE 11-4

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #4			GRADE	MATH PROGRAM PRESENTATION #4		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8	- -	- -	1	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
2	0-1.8	185	7.34	2	0-1.8	10	-3.69
	1.9-3.6	1,054	7.52		1.9-3.6	149	4.31
	3.7-5.4	94	3.76		3.7-5.4	- -	- -
3	0-1.8	85	2.66	3	0-1.8	10	2.10
	1.9-3.6	839	5.47		1.9-3.6	159	8.59
	3.7-5.4	57	5.12		3.7-5.4	- -	- -
4	0-1.8	112	3.99	4	0-1.8	3	-2.30
	1.9-3.6	1,416	4.46		1.9-3.6	474	6.71
	3.7-5.4	97	5.52		3.7-5.4	- -	- -
5	0-1.8	75	7.49	5	0-1.8	3	-6.90
	1.9-3.6	1,103	0.38		1.9-3.6	446	5.81
	3.7-5.4	43	2.78		3.7-5.4	5	-9.50
6	0-1.8	139	5.98	6	0-1.8	9	2.19
	1.9-3.6	680	6.29		1.9-3.6	346	7.80
	3.7-5.4	96	3.84		3.7-5.4	3	4.40
7	0-1.8	15	3.30	7	0-1.8	- -	- -
	1.9-3.6	65	4.75		1.9-3.6	21	-1.09
	3.7-5.4	192	4.14		3.7-5.4	7	5.60
8-9	0-1.8	63	4.12	8-9	0-1.8	3	1.80
	1.9-3.6	46	8.65		1.9-3.6	18	7.30
	3.7-5.4	143	2.74		3.7-5.4	3	5.70
10-12	0-1.8	17	14.10	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
1-12	ALL TIMES	6,616	4.69	1-12	ALL TIMES	1,669	6.02

TABLE 11-5

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #5			GRADE	MATH PROGRAM PRESENTATION #5		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8	- -	- -	1	0-1.8	- -	- -
	1.9-3.6	2	31.70		1.9-3.6	- -	- -
	3.7-5.4	57	16.70		3.7-5.4	- -	- -
2	0-1.8	-	- -	2	0-1.8	105	1.90
	1.9-3.6	370	0.79		1.9-3.6	23	11.40
	3.7-5.4	615	10.78		3.7-5.4	- -	- -
3	0-1.8	- -	- -	3	0-1.8	110	6.70
	1.9-3.6	660	4.37		1.9-3.6	35	1.60
	3.7-5.4	608	6.50		3.7-5.4	- -	- -
4	0-1.8	- -	- -	4	0-1.8	25	5.80
	1.9-3.6	464	3.31		1.9-3.6	78	9.95
	3.7-5.4	690	5.89		3.7-5.4	45	4.90
5	0-1.8	- -	- -	5	0-1.8	- -	- -
	1.9-3.6	349	3.50		1.9-3.6	69	7.16
	3.7-5.4	678	3.57		3.7-5.4	50	5.90
6	0-1.8	- -	- -	6	0-1.8	10	-1.00
	1.9-3.6	294	1.03		1.9-3.6	2	4.48
	3.7-5.4	579	1.85		3.7-5.4	55	-3.40
7	0-1.8	- -	- -	7	0-1.8	8	-0.70
	1.9-3.6	66	3.61		1.9-3.6	- -	- -
	3.7-5.4	717	7.40		3.7-5.4	- -	- -
8-9	0-1.8	- -	- -	8-9	0-1.8	4	-9.40
	1.9-3.6	33	6.09		1.9-3.6	- -	- -
	3.7-5.4	577	-0.44		3.7-5.4	- -	- -
10-12	0-1.8	- -	- -	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	377	4.97		3.7-5.4	- -	- -
1-12	ALL TIMES	6,932	4.60	1-12	ALL TIMES	669	4.75

TABLE 11-6

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #6			GRADE	MATH PROGRAM PRESENTATION #6		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8 1.9-3.6 3.7-5.4	6 80 - -	42.30 17.54 - -	1	0-1.8 1.9-3.6 3.7-5.4	3 15 - -	0.20 23.50 - -
2	0-1.8 1.9-3.6 3.7-5.4	44 746 36	17.40 8.96 2.00	2	0-1.8 1.9-3.6 3.7-5.4	- - 114 - -	- - 9.36 - -
3	0-1.8 1.9-3.6 3.7-5.4	24 713 49	16.60 5.72 -2.95	3	0-1.8 1.9-3.6 3.7-5.4	32 150 - -	5.22 9.04 - -
4	0-1.8 1.9-3.6 3.7-5.4	24 1,140 43	2.20 4.45 1.50	4	0-1.8 1.9-3.6 3.7-5.4	13 428 - -	16.24 15.45 - -
5	0-1.8 1.9-3.6 3.7-5.4	15 598 53	2.70 4.74 3.93	5	0-1.8 1.9-3.6 3.7-5.4	- - 209 - -	- - 13.08 - -
6	0-1.8 1.9-3.6 3.7-5.4	21 580 57	1.24 3.16 2.91	6	0-1.8 1.9-3.6 3.7-5.4	5 208 - -	8.30 9.39 - -
7	0-1.8 1.9-3.6 3.7-5.4	32 50 57	3.30 13.48 -0.61	7	0-1.8 1.9-3.6 3.7-5.4	- - 2 4	- - 15.50 9.30
8-9	0-1.8 1.9-3.6 3.7-5.4	20 10 57	3.80 2.60 2.19	8-9	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
1-12	ALL TIMES	4,455	5.56	1-12	ALL TIMES	1,183	12.31

TABLE 11-7

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #7			GRADE	MATH PROGRAM PRESENTATION #7		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	1	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
2	0-1.8 1.9-3.6 3.7-5.4	77 309 5	3.70 2.73 28.00	2	0-1.8 1.9-3.6 3.7-5.4	- - 308 13	- - 2.98 10.24
3	0-1.8 1.9-3.6 3.7-5.4	- - 273 9	- - -1.84 2.00	3	0-1.8 1.9-3.6 3.7-5.4	24 353 2	7.10 8.06 -0.85
4	0-1.8 1.9-3.6 3.7-5.4	- - 147 2	- - 1.64 -9.40	4	0-1.8 1.9-3.6 3.7-5.4	- - 344 9	- - 5.85 12.40
5	0-1.8 1.9-3.6 3.7-5.4	- - 121 5	- - -0.21 15.30	5	0-1.8 1.9-3.6 3.7-5.4	- - 353 9	- - 2.38 19.40
6	0-1.8 1.9-3.6 3.7-5.4	- - 134 5	- - 0.18 -0.70	6	0-1.8 1.9-3.6 3.7-5.4	- - 281 8	- - 4.90 3.80
7	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	7	0-1.8 1.9-3.6 3.7-5.4	- - 4 - -	- - 14.20 - -
8-9	0-1.8 1.9-3.6 3.7-5.4	- - 4 - -	- - -12.50 - -	8-9	0-1.8 1.9-3.6 3.7-5.4	- - 6 - -	- - 7.00 - -
10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -	10-12	0-1.8 1.9-3.6 3.7-5.4	- - - - - -	- - - - - -
1-12	ALL TIMES	1,091	0.94	1-12	ALL TIMES	1,714	5.08

TABLE 11-8

MEAN GAIN SCORES BY PRESENTATION, BY SUBJECT,
BY GRADE, AND BY TIME

GRADE	READING PROGRAM PRESENTATION #8			GRADE	MATH PROGRAM PRESENTATION #8		
	Time: Hrs./Wk.	N	Mean NCE Gain		Time: Hrs./Wk.	N	Mean NCE Gain
1	0-1.8	- -	- -	1	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
2	0-1.8	9	-3.49	2	0-1.8	- -	- -
	1.9-3.6	12	-4.40		1.9-3.6	1	18.50
	3.7-5.4	94	1.42		3.7-5.4	20	9.64
3	0-1.8	3	14.70	3	0-1.8	32	4.60
	1.9-3.6	17	5.80		1.9-3.6	15	-3.21
	3.7-5.4	70	-1.44		3.7-5.4	34	-8.73
4	0-1.8	5	-0.80	4	0-1.8	26	7.10
	1.9-3.6	31	1.08		1.9-3.6	21	13.10
	3.7-5.4	79	2.48		3.7-5.4	87	1.71
5	0-1.8	10	4.80	5	0-1.8	40	0.80
	1.9-3.6	15	4.79		1.9-3.6	32	11.70
	3.7-5.4	70	6.63		3.7-5.4	29	10.39
6	0-1.8	8	5.90	6	0-1.8	- -	- -
	1.9-3.6	10	2.10		1.9-3.6	42	0.50
	3.7-5.4	82	2.10		3.7-5.4	44	-4.11
7	0-1.8	- -	- -	7	0-1.8	- -	- -
	1.9-3.6	42	4.40		1.9-3.6	- -	- -
	3.7-5.4	24	0.88		3.7-5.4	- -	- -
8-9	0-1.8	- -	- -	8-9	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	21	3.62		3.7-5.4	- -	- -
10-12	0-1.8	- -	- -	10-12	0-1.8	- -	- -
	1.9-3.6	- -	- -		1.9-3.6	- -	- -
	3.7-5.4	- -	- -		3.7-5.4	- -	- -
1-12	ALL TIMES	602	2.37	1-12	ALL TIMES	423	2.76

III. SUMMARY AND CONCLUSIONS

This section is based on a careful review of the data presented in Section II. The summary derived from the review is followed by concluding remarks.

Summary

All 55 local education agencies submitted school year 1978-79 Title I impact data to the state staff on the evaluation forms provided in the ESEA Title I Evaluation Handbook. The data and information supplied on the submitted forms was the sole source which was utilized to answer the broad questions concerning Title I impact. This subsection summarizes the statewide findings relative to the questions.

Question 1: How many students participated in the Title I program? One crucial piece of information sought by funding agencies is the maximum number of persons who have been reached by a program. The unduplicated count of Title I participants was 41,573 which was inclusive of students assigned to special education and grades 1-12. The heaviest concentration was in grades 1-6. (See Table 1, page 14.)

Decision makers need to know how their resources are distributed. In Title I, they need to know how many students received special services in the curricular areas of reading and math. Special services were received by 33,547 students in reading and 10,355 students in math (duplicated counts).

Question 2: How many participating students were evaluated? The number of unduplicated participants and the number of duplicated participants are provided to the funding agencies and decision makers as the maximum number of students influenced by Title I programs. However, since Title I was established to serve those with the greatest educational need, many students may be served for periods of time which are too short for the students to be included in the evaluation. This results in a smaller number of tested students reported in Table 3, page 16, when compared with the numbers recorded in Table 2.

The number of students actually tested was 25,528 in reading and 8,094 in math; however, these are not the same as those used in determining impact. The number used for impact is smaller as a result of the application of a policy rule. (Draft: Policy Manual, Subpart D--Evaluation, March 9, 1979, page 4.) The rule is stated as follows:

> . . . if an evaluation sample includes two-thirds or fewer of the student project membership, the data should be considered probably not representative . . .

Application of this rule to the group data as reported from the LEA's reduced the number of test scores which were usable in evaluation to 23,507 in reading and 7,016 in math.

Question 3: For those students evaluated, what were the mean gain scores in NCE's? The number of students evaluated and the mean NCE gains as reported in Table 4 through Table 11-8 are based on a reduced number of test scores in keeping with the policy of using scores only when two-thirds or more of a group are tested. Table 4 through Table 10 provide n-counts and mean NCE gains as a function of combinations of input variables. The overall n-count and mean NCE gains are equal across the

tables. These overall mean gains are 4.8 NCE's in reading and 6.5 NCE's in math. These gains compare with 5.7 NCE's in reading and 7.7 NCE's in math which were reported for school year 1977-78. The 1977-78 report was based on data from 45 of the 55 LEA's, while this report is based on data from all LEA's.

A perusal of Tables 4, 5, 6, and 8 indicates a range of mean NCE gain scores in the reading program by grade. The following denotes the range of NCE gains by grade level with a second interacting variable identified in parenthesis.

Grade 2	4.0 (S & S)[1] to 14.9 (F & S)
Grade 3	0.6 (A) to 11.5 (F & F)
Grade 4	2.7 (A) to 8.4 (F & S)
Grade 5	1.3 (S & S) to 7.9 (F & S)
Grade 6	1.5 (A) to 7.1 (F & S)

In the same tables, math is shown to have the following range of mean NCE gains.

Grade 2	1.4 (1) to 6.3 (T-A)
Grade 3	5.6 (S & S) to 15.1 (F & S)
Grade 4	4.0 (3) to 25.9 (F & S)
Grade 5	2.0 (1) to 18.8 (F & S)
Grade 6	2.4 (3) to 16.0 (F & S)

These summaries do not include gains based on fewer than 50 students, gains outside of grade levels 2-6, or gains for the presentation identified as "other" in Table 6.

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[1] S & S means pretest was in the spring followed by posttest the next spring. F & S means the pretest to posttest cycle was from fall-to-spring. F & F means the pretest and posttest cycle was from fall-to-fall. T-A refers to teacher and aide. T refers to teacher. A refers to aide. One, 2, and 3 refers to time categories of 0.0-1.8 hours, 1.9-3.6 hours, and 3.7-5.4 hours, respectively.

In Tables 7, 9, and 10, the reading program by presentation was shown to have the following mean NCE gains.

Presentation 1	2.8 (S & S) to 14.8 (2)
Presentation 2	1.4 (1) to 13.1 (2)
Presentation 3	1.8 (1) to 10.9 (F & S)
Presentation 4	4.0 (3) to 9.4 (F & S)
Presentation 5	1.8 (S & S) to 9.8 (F & S)
Presentation 6	1.3 (3) to 10.2 (F & S)
Presentation 7	0.5 (2) to 5.2 (F & S)
Presentation 8	2.1 (S & S) to 3.9 (F & S)

In the same tables, math is shown to have the following range of mean NCE gains.

Presentation 1	- - to - -
Presentation 2	4.4 (S & S) to 18.4 (F & S)
Presentation 3	- - to - -
Presentation 4	5.5 (S & S) to 11.8 (F & S)
Presentation 5	2.2 (3) to 7.1 (2)
Presentation 6	7.0 (S & S) to 25.7 (F & S)
Presentation 7	4.9 (2) to 5.1 (T)
Presentation 8	0.8 (3) to 5.8 (2)

These summaries do not include gains based on fewer than 50 students.

Tables designated as 11 are concerned with presentation 1 through 8. The second part of the table number--the number following the hyphen--indicates the presentation. These eight tables provide the mean NCE gain as a function of the interaction of presentation and subject with grade level and time.

The 23,507 reading and 7,016 math students who were tested were distributed among the cells in eight tables--Table 11-1 through Table 11-8. This distribution produces small n-counts, or zero n-counts, in many cells. This situation occurs most frequently at grades 1, 7, 8-9, and 10-12. Therefore, the summary that follows is limited to those grades and cells which have the higher n-counts--grade levels 2-6. These grades have a higher percentage of non-suspect mean NCE gains.

Range of mean NCE gains for reading:

Grade 2	0.8 (5)[1] to 14.1 (3) (twelve)[2]
Grade 3	-1.8 (7) to 10.2 (3) (eleven)
Grade 4	1.6 (7) to 9.0 (3) (eleven)
Grade 5	-0.2 (7) to 7.8 (3) (eleven)
Grade 6	0.2 (7) to 6.3 (4) (twelve)

Range of mean NCE gains for math:

Grade 2	1.9 (5) to 9.4 (6) (five)
Grade 3	4.9 (2) to 9.0 (6) (five)
Grade 4	1.7 (8) to 15.5 (6) (seven)
Grade 5	2.4 (7) to 13.1 (6) (six)
Grade 6	-3.4 (5) to 9.4 (6) (six)

These summaries do not include gains based on fewer than 50 students.

Across all grade levels, inclusive of all time categories, the mean NCE gains were from a low of 0.9 (presentation 7) to a high of 7.8 (presentation 3) for the reading program. Applying the same parameters to the math program produced a low of 2.8 (presentation 8) and a high of 14.4 (presentation 1). However, we may disregard presentation 8--a non-definable category, which establishes presentation 5 with the lowest gain (4.8 NCE's). And, since the gain for presentation 1--14.4 NCE's--is based on a relatively small n-count of 71, we may have more confidence in the next highest gain--12.3 NCE's--for presentation 6 which is based on an n-count of 1,183.

Overall, the presentation producing lowest gains in reading is 7, while the presentation producing highest gains is 3. In math, presentation 5 provided the lowest gains and presentation 6 provided the highest gains.

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[1] An arabic number in parenthesis indicates the presentation number.

[2] A written number in parenthesis indicates the number of cells surveyed in ascertaining the low and high NCE's.

Conclusions

This report, unlike the 1977-78 report, is based on data from the operating Title I program in all 55 local education agencies. The representativeness of the report should be greatly improved.

The results of the program evaluation are influenced by the evaluation method. In West Virginia the method is limited to the implementation of Model A, a norm-referenced model. This model as developed for the USOE by the RMC Research Corporation is described in Appendix A. The reader is advised to read the model description to assist in adequately forming opinions for discussion, decision making, or program planning. Additionally, the reader should read Section I carefully. Section I provides the reader with background leading to this report.

This is the second year West Virginia has used a computer to analyze Title I program data. The computer has proven to be very effective in locating errors such as computation, excessive quantities, reversed mathematical signs, and misplaced decimals. Also, the computer has been very efficient in expanding or reducing the size of the group whose test scores are being analyzed. This ability is appreciated since all analyses of the data require looking at impact on the basis of differing sets of variables. As the variables change, so must the number of students change who fit the changed characteristics.

The efficiency of the computer has produced information with a higher reliability. The computer process was improved over the previous year with resultant improvement in the analysis. Additionally, meetings were held across the state in the summer of 1979 to review the LEA's processes and draft reports for errors prior to submission to the state. This quality control step greatly improved the final evaluation reports as submitted.

Very little impact data was reported at the first grade level. Such data is not required by the U.S. Department of Education nor the state at this time. The first grade exemption came about as a result of problems of obtaining reliable test results at this level. Thus, all first grade data reported were volunteered.

This year, as in school year 1977-78, greater numbers of students participated from grades 2-6, and greater numbers were tested at the same grade levels. For this reason, conclusions based on the data description in Section II and the Summary in this section primarily are limited to the same grade levels. Since the number of students tested at other grade levels is smaller, the computed mean NCE gains may be less reliable at other grade levels.

The overall mean NCE gains for reading and math are respectable. These gains are 4.8 NCE's (reading) and 6.5 NCE's (math). All NCE gains greater than zero are considered good. And, any positive gain indicates Title I students have made a positive improvement through participation in special programs. Nationally, a gain of approximately 3-5 NCE's in reading and 5-7 NCE's in math is expected of those who participate in Title I programs. Thus, the Title I program in West Virginia seems to be producing equivalent impact.

At grade levels 2-6, the fall-to-spring testing cycle offered considerable advantages in terms of mean NCE gains. That is, it seems a school system might improve their gains markedly by simply changing from a spring-to-spring cycle to a fall-to-spring cycle.

Some trends indicate a time of 1.9 to 3.6 hours per week of special instruction for Title I students may be more effective than either a smaller amount or a larger amount of time.

Presentation 3 is strongly indicated as the most effective procedure for reading instruction, while presentation 6 seems to be most effective in math. Presentation 7 seems to be least effective in reading; however, in math the least effective presentation seems to change with the grade level. Presentation 5 appears to be ineffective in math instruction more often than other presentations.

For this report to affect Title I, those teachers and administrators who read it must review and reanalyze their local data. They may wish to ask how the statewide results compare with their local results. Some local changes in the Title I instructional program may be desirable following such a review.

The quality of the Title I instructional program and, in turn, the long range impact of Title I is largely dependent on good evaluation, appropriate analysis, accurate interpretation, and program changes which reflect the interpretation.

APPENDIXES

APPENDIX A

ALTERNATIVE MODELS FOR TITLE I EVALUATION

There have been three models developed for the evaluation of Title I; the norm-referenced model, the control group model and the special regression model. Within each of the three models is the latitude to use either nationally normed test instruments or criterion referenced instruments. There are, therefore, six alternative methods that may be used in the evaluation of Title I. Each of the models has certain criteria that must be met, and each of the models should yield valid results if properly implemented. The following model descriptions provide a summary of the various requirements for implementation and the expected results.

MODEL A--Norm-Referenced Design

This model is intended to show the gain in achievement made by the target group relative to the gain that would be expected based on a national sample. It is probably the weakest of the three available models, but is the easiest to implement, particularly with regard to the Federal regulations in 1977-78. A number of variations to the basic requirement for implementation of Model A are possible. Without regard to these variations, four components are necessary. A pretest and posttest must be administered. An instrument different from the pretest must be administered for selection of participants. The tests must be used at a date close to the empirical norming dates of the instruments. In the event that a criterion referenced test or a locally normed test is used, a nationally normed test must also be administered.

The primary advantages to using Model A is that it requires no testing of non-participating children, little statistical manipulation, and does not interfere with selection of participants. It does, however, assume equality between the norming sample and the group from which the local participants are taken.

MODEL B--Control Group Design

This design is the most scientifically acceptable and is expected to provide the most reliable evaluation information. The most important requirement for implementing Model B is the selection of a control group. The control must be as similar to the treatment group as possible. Ideal selection procedures provide for the random assignments of eligible children to the control and treatment groups. Variations on this procedure should be employed very carefully. The result, however, should be random in effect. In addition to appropriate selection procedures, treatment of control and experimental groups must be the same with the exception of the existence of Title I program activities for the experimental group. All children in both groups must receive a pre and posttest. If a criterion referenced test or locally normed test is used, a standardized test must also be used in order that national norms may be applied to the evaluation instrument. Although the best model, Model B is very difficult to implement properly and still stay within the Federal regulations (as stated in 1977-78).

MODEL C--Special Regression Design

The regression model is considered a reasonable method of measuring the effect of Title I. It requires that all children within each grade for which there are Title I participants for each school be pretested and

posttested. As a result, it involves the testing of a large number of children who are not Title I participants. The premise upon which the regression design is based is that if the regression line for the non-participants is projected over the regression line for the treatment group, the difference in location of the two lines would represent the difference between achievement gain and expected gain for the treatment group. One of the more serious drawbacks of the regression model is the need for a strict delineation between participants and non-participants on the basis of some quantifiable measure.

APPENDIX B

CONVERSION TABLE

Percentile to Normal Curve Equivalent

%ile	NCE	%ile	NCE	%ile	NCE
1	1.0	36	42.5	71	61.7
2	6.7	37	43.0	72	62.3
3	10.4	38	43.6	73	62.9
4	13.1	39	44.1	74	63.5
5	15.4	40	44.7	75	64.2
6	17.3	41	45.2	76	64.9
7	18.9	42	45.8	77	65.6
8	20.4	43	46.3	78	66.3
9	21.8	44	46.8	79	67.0
10	23.0	45	47.4	80	67.7
11	24.2	46	47.9	81	68.5
12	25.3	47	48.4	82	69.3
13	26.3	48	48.9	83	70.1
14	27.2	49	49.5	84	70.9
15	28.2	50	50.0	85	71.8
16	29.1	51	50.5	86	72.8
17	29.9	52	51.1	87	73.7
18	30.7	53	51.6	88	74.7
19	31.5	54	52.1	89	75.8
20	32.3	55	52.6	90	77.0
21	33.0	56	53.2	91	78.2
22	33.7	57	53.7	92	79.6
23	34.4	58	54.2	93	81.1
24	35.1	59	54.8	94	82.7
25	35.8	60	55.3	95	84.6
26	36.5	61	55.9	96	86.9
27	37.1	62	56.4	97	89.6
28	37.7	63	57.0	98	93.3
29	38.3	64	57.5	99	99.0
30	39.0	65	58.1		
31	39.6	66	58.7		
32	40.1	67	59.3		
33	40.7	68	59.9		
34	41.3	69	60.4		
35	41.9	70	61.0		